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TITLE: Appliance supply distribution, dispensing and use system methodAbstract Text (1):

The present invention is an appliance supply distribution and dispensing system and method for distributing appliance supplies to a home or business and which involves a computerized system which facilitates dispensing or using one or more supplies from an appliance. The computerized system monitors the supply level(s) and, when necessary, automatically orders and delivers additional supplies. In addition, the computerized system automatically detects dispensing, use or appliance problems and orders and arranges for repair service.

Parent Case Text (2):

This application is a continuation of U.S. patent application Ser. No. 09/790,349 filed on Feb. 21, 2001 (Abandoned on Oct. 24, 2002) which is a continuation-in-part of U.S. patent application Ser. No. 09/589,725 filed Jun. 8, 2000, both of which are hereby incorporated in their entirety and relied upon.

Brief Summary Text (4):

The present invention relates in general to a system and method for distributing and dispensing or using appliance supplies or products, and in particular to a distribution and dispensing system which facilitates dispensing or using one or more supplies by an appliance, which tracks supply use, which automatically orders supplies as necessary, which facilitates the delivery of supplies to the users, which enables the users to determine supply usage, which enables users to change the supplies, and which reduces the need to store conventional supply containers.

Brief Summary Text (6):

Many households in the United States and throughout the world use supplies or appliance supplies on a daily basis in connection with appliances such as refrigerators, washing machines, clothing dryers, dishwashing machines, water filters, furnaces and humidifiers. Typical appliance supplies include consumable products such as laundry detergents, dish washing detergents, fabric softeners, bleaches, drying sheets, beverages, food products and filters. To maintain an adequate supply of such appliance supplies, consumers must continuously supply their homes with various packaged products. This task can be relatively burdensome for families which experience a large consumption of such products or appliance supplies, in part because the appliance supply containers are often somewhat heavy and the appliance supply containers occupy substantial space in or near the appliances. Additionally, the cost in dollars and the time spent in purchasing such appliance supplies on an annual basis can be significant. Accordingly, there is a need for an appliance supply distribution and dispensing system.

Brief Summary Text (8):

The present invention provides an appliance supply distribution and dispensing system which solves the above problems by enabling users to obtain one or more supplies for an appliance, and which tracks, automatically orders and delivers or distributes the products or supplies used or dispensed by the appliances to the homes of the users of the present system. The appliance supply distribution and dispensing system of the present invention is referred to herein for brevity alternatively as the "system," "distribution system," "dispensing system" or the "appliance supply dispensing system." However, the scope of the present invention is not intended to be limited by such abbreviated terms or the use of any other abbreviated terms used herein to describe the present invention or components, steps or processes thereof.

Brief Summary Text (9):

Generally, the system of the present invention includes a plurality of appliance supply

dispensing apparatuses housed in a plurality of appliances, at least one order processing system which communicates with the appliance supply dispensing apparatuses through a suitable communication channel and one or more supplier systems which communicate with the order processing system through a suitable communication channel. For purposes of this application, the present invention in part will be described in relation to one appliance supply dispensing apparatus, one ordering processing system and one supplier system. It should be appreciated that the system of the present invention includes a plurality of dispensing apparatuses in the appliances of multiple users, a plurality of order processing systems and a plurality of supplier systems which are preferably, but not necessarily, located in the geographic vicinity of the users to facilitate rapid and less expensive delivery of the ordered appliance supply containers to users of the system. Delivery by local suppliers or distributors will also conform to current business agreements between certain distributors and suppliers.

Brief Summary Text (10):

The appliance supply dispensing apparatus in the appliance is adapted to dispense or use at least one, and depending on the appliance, a plurality of appliance supplies pre-selected by the user. The appliance supply dispensing apparatus preferably includes an appliance supply dispensing or use computer, processor or appliance computer, a user interface panel or terminal (if necessary) connected to the dispensing processor, a dispenser or appliance supply mixing mechanism (if necessary) connected to the appliance supply dispensing processor, and one or more appliance supply mechanisms or apparatuses connected to the dispenser. The appliance supply mechanism preferably includes one or more housings for storing one or more appliance supply containers or the supply itself, and one or more actuators such as pumps or other suitable mechanisms (if necessary) for drawing or otherwise directing the appliance supply from the appliance supply containers or housing. The system of the present invention may be implemented in any appliance which dispenses or uses a consumable product or supply such as a consumable packageable product or supply.

Brief Summary Text (11):

One example of an appliance which may be used in conjunction with the present invention is a washing machine. The washing machine includes a detergent supply mechanism. The detergent supply mechanism includes a housing for storing detergent and preferably one or more detergent supply containers or canisters and a suitable mechanism for releasing the detergent supply from the detergent supply container or housing. The washing machine preferably includes one user readily accessible housing adapted to hold the detergent supply containers. This enables the user to easily change the detergent supply containers. The detergent supply containers are also preferably suitably sized to fit within the housing and are suitably sized for shipment via conventional delivery services.

Brief Summary Text (13):

It should also be appreciated that the washing machine (or any appliance in accordance with the present invention) could include multiple dispensing mechanisms (and one or more indicators) for different supplies or products such as different detergents or different types of products (i.e., detergents, bleaches and fabric softeners). The dispensing computer or appliance computer could monitor all of these products or appliance supplies and make the appropriate orders as necessary.

Brief Summary Text (14):

In another example, the system of the present invention may be implemented in a refrigerator where appliance supplies are preferably mixed or combined to form a final product such as a ready to drink beverage. The refrigerator includes a CO.sub.2 gas supply mechanism, a drink supply mechanism and a water supply mechanism connected to a dispenser. The CO.sub.2 supply mechanism includes a housing for storing one or more CO.sub.2 supply containers or canisters and a suitable mechanism for releasing the CO.sub.2 gas from the CO.sub.2 supply containers. The drink supply mechanism includes a housing for storing one or more drink supply containers or canisters and a suitable mechanism for releasing the drink supply from the drink supply containers. One or more readily accessible housings could be adapted to hold both the drink supply containers and CO.sub.2 supply containers. This enables the user to easily change the drink supply containers and CO.sub.2 supply containers. The drink supply containers and CO.sub.2 supply containers are also preferably suitably sized to fit within the housing and are suitably sized for shipment via conventional delivery services.

Brief Summary Text (16):

The appliance's dispensing computer or appliance computer and user interface panel or terminal preferably coact to enable the user to register as a user with the order processing system, order additional supplies as desired, and to change the supplies dispensed by the appliance. For instance, if the user wants to try a new supply or product, the user enters such an order through the user interface panel. Furthermore, if the appliance or part thereof such as the dispensing apparatus breaks down or has any mechanical or technical problems, the system can be adapted to automatically order repair services, which causes a repair service to contact the user, determine an acceptable repair date and to repair the appliance on the repair date.

Brief Summary Text (17):

In one embodiment of the present invention, the dispensing computer or appliance computer directly communicates with the order processing systems through communication channels such as existing telephone lines, cable lines, wireless communications or the internet. In a preferred embodiment of the present invention, the dispensing or appliance computer communicates with a home area or home gateway network in the home of the user which facilitates communication between home appliances, audio and visual equipment, and computing devices. Such home gateway networks enable users to monitor and control all of the electronic equipment in their homes. The home gateway network in turn communicates over a suitable communication channel with the order processing systems. It should be appreciated that all of the appliances in a home or business may use the same or different ordering processing systems to order various types of supplies or products.

Brief Summary Text (18):

After an appliance having the dispensing apparatus of the present invention is installed in a user's home or other location and the dispensing or appliance computer establishes communication with the appropriate order processing system indirectly through the home gateway network or directly through another suitable communication channel, the user uses the user interface panel to select one or more supplies. The system automatically orders appropriate supplies (if the appliance is purchased without such supplies). Preferably within three days, the supply system delivers the ordered supplies to the user and the user installs the supply containers in the appliance supply dispensing apparatus to begin to dispense the supply or products. The dispensing computer monitors the level of supply and orders more supply when the supply reaches certain predetermined levels.

Brief Summary Text (19):

The appropriate order processing system receives and processes orders from a plurality of dispensing or appliance computers and transmits the orders to the appropriate supplier systems which are designated to serve the users. The order processing system generally includes a server or processor for receiving and processing the orders from the dispensing computers and for sending the orders to the supply systems, a data storage device for storing historic order and consumption information as well as appliance supply and other information, access terminals and input/output devices.

Brief Summary Text (20):

The supplier system receives orders from the order processing system for particular users (preferably in a predetermined geographic region) and facilitates the delivery of supplies to such users of the system of the present invention. The supplier system generally includes a server or processor for receiving the selected orders from the order processing system and for facilitating order fulfillment, access terminals and input/output devices. The supplier system also facilitates or provides a deliverer for delivering the supply containers to the user and provides for repair services for the appliances. Any suitable deliverer may deliver the supply container to the user; however, preferably the appliance supplies are delivered by a common carrier such as the postal service, United Parcel Service, Federal Express, etc. It should be appreciated that while the appliance supply containers or canisters could be of any suitable size, in the preferred embodiments of the present invention, they are suitably sized for such commercial shipment and to fit in the appropriate housing in the appliance.

Brief Summary Text (21):

The system of the present invention enables a user or consumer to sample a plurality of various supplies which the user may not ordinarily have the ability to sample or obtain. For a variety of reasons, many supply products are unavailable to consumers in many parts of the United States and in many parts of the world. The system provides an interface through which the user can select any supply which is supplied by the implementor of the system. The present invention

makes a plurality of supplies available to the user including supplies not generally available in the user's geographic area. The present invention thus provides a direct appliance supply distribution system to the user of the system as well as an appliance supply sampling system which enables users of the system to sample products on a regular basis including products or appliance supplies the user would not normally be exposed to.

Brief Summary Text (23):

Accordingly, the appliance supply distribution and dispensing system of the present invention: (a) employs an appliance to facilitate dispensing or use of one or more supplies selected by the user; (b) tracks the supply usage; (c) automatically orders additional supplies as necessary; (d) enables the users to monitor appliance supply consumption; (e) enables the user to select the appliance supplies from a large number of available supplies and to sample a wide variety of supplies; (f) enables the user to change the supplies dispensed; (g) facilitates direct delivery of supply or supply containers to the user; (h) orders repairs as necessary; (i) notifies users of new supplies available through the system; (j) reduces the need to store conventional supply containers; (k) reduces supply waste; (l) reduces waste of containers and container materials by providing the same amount of supplies in smaller and fewer containers; and (m) reduces the need for homeowners, consumers, customers and other users of the system (referred to herein as "users") to purchase for their homes containers of numerous different types of supplies such as detergents, dishwashing liquids and beverages.

Brief Summary Text (24):

It is therefore an advantage of the present invention to provide an appliance supply distribution and dispensing system.

Brief Summary Text (25):

A further advantage of the present invention is to provide an appliance supply distribution and dispensing system which dispenses or uses one or more supplies in an appliance.

Brief Summary Text (26):

Another advantage of the present invention is to provide an appliance supply distribution and dispensing system which automatically reorders supplies.

Brief Summary Text (27):

Yet another advantage of the present invention is to provide an appliance supply distribution and dispensing system which enables users to determine supply use, order additional supplies and to change supplies used by appliances.

Drawing Description Text (4):

FIG. 3 is a schematic diagram of one appliance embodiment of the present invention;

Drawing Description Text (6):

FIG. 5 is an schematic diagram of an example of a multi-appliance embodiment of the present invention;

Detailed Description Text (2):

Referring now to the drawings and in particular to FIG. 1, one embodiment of the appliance supply distribution and dispensing system of the present invention, generally indicated by numeral 10, includes one or more appliances 12 which communicate with one or more order processing systems 14 through a dispenser communication channel 16. The order processing system (s) 14 communicate with one or more supplier systems 18 through a suitable communication channel 20. The supplier system(s) 18 provide one or more supplies 22 to the user of the appliance(s) 12 in response to an order. Each appliance 12 which is installed with a supply 22 preferably includes an appliance computer or supply dispensing computer 24, supply 22 and a supply dispenser 26. The supply dispensing computer may be adapted to communicate with either or both the supply 22 or supply dispenser 26.

Detailed Description Text (3):

A user inserts supply 22 into a supply housing (not shown) within, or connected to or associated with the appliance 12. The appliance 12 is adapted to use the supply 22 for purposes such as washing items, rinsing items or producing beverages. Preferably, the appliance 12 includes a supply dispenser 26 for dispensing supply 22. However, it should be appreciated that certain supplies, such as water treatment supplies, filters and batteries are used but not

necessarily dispensed when used. These types of supplies 22 are used directly within their supply housings (not shown). As a user consumes or uses supply 22, the appliance or dispenser computer 24 preferably tracks the decreasing amount of supply 22.

Detailed Description Text (4):

When the supply 22 reaches a predetermined depletion level or if a user makes an input or request, the appliance or dispensing computer 24 transmits a supply order to the order processing system 14. The order processing system 14 processes the order, and if acceptable, transmits the order along communication channel 20 to the supplier system 18. The supplier system 18 then delivers supply 22 to the appliance 12.

Detailed Description Text (5):

It should be appreciated that the system 10 can also deliver services to the appliance in response to a service order transmitted by the appliance or dispensing computer.

Detailed Description Text (6):

It should also be appreciated that the system can include various combinations of appliances 12, order processing systems 14 and supplier systems 18 for various scenarios. For example, a single order processing system 14 could serve various types of appliances 12 or supplies 22 as illustrated in FIG. 2A. Alternatively, the system 10 could include a single order processing system 14 for each type of appliance 12 or supply 22 as illustrated in FIG. 2B. Similarly, a single supplier system 18 could serve various types of appliances 12 and supplies 22 as illustrated in FIG. 2C. Alternatively, the system 10 could include a single supplier system 18 for each type of appliance 12 or supply 22, as illustrated in FIG. 2D. Also, as illustrated in FIG. 2E, different order processing systems 14 and supplier systems 18 can serve a single appliance 12 which has needs for different types of supplies 22.

Detailed Description Text (8):

Appliance

Detailed Description Text (9):

As illustrated in FIG. 3, in one embodiment of the present invention, the appliance 12 includes an appliance supply dispensing apparatus 28 and standard mechanisms for such an appliance and is specifically constructed, structurally and electrically, to house and accommodate the supply dispensing apparatus 28. The supply dispensing apparatus 28 preferably includes: (i) a supply dispensing computer or processor 24; (ii) a user interface panel or terminal 34; (iii) a dispensing mechanism 30; (iv) a supply mechanism, apparatus or dispenser 26; (v) a housing 32 for storing supply or one or more supply containers 33; (vi) a plurality of electrical communication lines 36; and (vii) one or more supply fluid communication lines 38. These components are preferably mounted at suitable places in appliance; however, it should be appreciated that one or more of these components could be mounted in a housing adjacent to the appliance in accordance with the present invention.

Detailed Description Text (11):

The dispensing computer, appliance computer or processor 24 of the present invention, as described in more detail below, monitors all dispensing or depletion of supplies, the amount of supply remaining, the supplies ordered, the total supply use or consumption for each type of supply and all inputs or changes to the system or appliance supply requested by the user.

Detailed Description Text (12):

In one embodiment of the system of the present invention, the appliance supply dispensing processor 24 communicates directly with the server in the order processing system 14 via a dial-up connection or modem. In another embodiment of the present invention, the appliance supply dispensing processor 24 communicates indirectly with the server in the order processing system via a dial-up connection to an internet access provider which enables connectivity to the server. In a further embodiment of the present invention, the supply dispensing processor 24 communicates indirectly with the server in the order processing system via a home gateway server using a direct dial-up connection. In a still further embodiment of the present invention, the appliance supply dispensing processor 24 communicates indirectly with the server in the order processing system via a home gateway server using an indirect dial-up connection to an internet access provider which enables connectivity to the server. In a still further embodiment of the present invention, the appliance supply dispensing processor 24 communicates indirectly with the server in the order processing system via a home gateway server using an

indirect Ethernet home network internet connection with enables connectivity to the central server. As further discussed below, in any of these embodiments, the supply dispensing processor 24 automatically communicates orders generated by the supply dispensing processor 24, user registration information, user orders generated by the user, repair orders and user consumption and use information to the order processing system 14.

Detailed Description Text (14):

In one embodiment of the present invention, the system communicates with the user through the user interface panel or terminal 34 which is preferably a conventional touch screen adapted to display a plurality of interfaces. Alternatively, other user interfaces such as selections, buttons, lights, indicators, or other suitable mechanical or electronic devices may be used in conjunction with the present invention. The user can use the interface or interface panel 34 or other devices to cause the appliance to use a supply or product. It should also be appreciated that the appliance could automatically dispense or use a supply or product, such as dispensing one type of washing detergent (from a plurality of different detergents) when different washing cycles are used. For energy saving purposes, the user interface panel 34 or the supply dispensing apparatus 12 preferably includes a motion detector or sensor (not shown) in the appliance. The motion sensor detects when a user approaches the appliance and causes the user panel to illuminate the touch screen when the user approaches the appliance.

Detailed Description Text (15):

The user panel is adapted to display a plurality of interfaces to the user as illustrated in FIGS. 4A through 4J. The initial interface includes one or more products or selections. However, it should be appreciated that the number of selections may vary in accordance with the present invention. In the example base or primary interface 40a illustrated in FIG. 4A and displayed by the user interface panel 34, the selections 42 include SUPPLY A-2, SUPPLY B-1, SUPPLY C-2, SUPPLY D-3, SUPPLY E-2 and SUPPLY F-6. The user may touch any of these selections 42 to dispense a supply or to cause the appliance to dispense a supply. It should also be appreciated that in one embodiment of the present invention, only one selection 42 may be available such as one type of dishwashing soap in a dishwasher.

Detailed Description Text (16):

This primary interface 40a also includes several other commands including a back or return command 44a which causes the user panel to display a previous interface, a forward command 44b which causes the user panel to display the next interface, a change brands command 44c which causes the user interface panel 34 to display the interfaces which enable the user to order different brands of supply and to physically change supply, a question command 44d which causes the user interface panel 34 to display interface contact information for the user including who to contact if the user has questions, a home command 44e which causes the user interface panel 34 to display an interface which provides information regarding the use or consumption of supply through the system in the user's appliance and an information command 44f which causes the user interface panel 34 to display interfaces which enable the user to find out more information regarding supply available through the system. Commands 44a to 44f are preferably accessible from every user interface, as illustrated in FIGS. 4A through 4J, to enable the user to navigate through the system and perform the functions provided by the system. It should be appreciated that additional functions or options could be added to the system and to the interfaces.

Detailed Description Text (20):

The dispensing computer replaces the new supply selection logo on the primary interface when the new supply is delivered to the user and the user inserts the new supply into the housing 32 in the appliance. A change brands interface (not shown) or an additional interface is provided to the user for the user to inform the dispensing computer that the user is changing or replacing a supply container. In one embodiment, this could include an authorization code. Alternatively, the dispensing apparatus could read a bar code or other label on the supply container that informs the dispensing computer of the change as further discussed below. Preferably, the interface provides a message screen which informs the user how to change the supply and specifically (if applicable) in which slot the old supply which needs to be replaced is located. Each slot preferably is numbered, lettered, has other indicia or has an alternative designation for identifying the slot to the user and distinguishing the slots. The interface may also provide a change canister command which the user presses when the user is going to change a supply container.

Detailed Description Text (25):

It should be appreciated that the system could be adapted to provide each individual in a household having the system with a separate user code which would enable the system to track individual use on consumption. The individual would enter this code each time the user used a supply, for instance, when obtaining a drink, washing clothes, washing dishes or using any appliances supported by the system.

Detailed Description Text (26):

It should also be appreciated that the user interface panel could serve other functions such as enabling the user to adjust temperatures or other conditions in an appliance.

Detailed Description Text (27):

It should further be appreciated that the user interface panel may provide the user with access to the internet, multimedia entertainment and other commercial information through the panel and suitable speakers installed in or on the appliance.

Detailed Description Text (29):

With reference to FIG. 5, in one embodiment of the present invention the system 10a which reaches a user's home 46, includes a home gateway server 48 for communicating to one or more appliances 12a through 12e. Each dispensing computer 24a through 24e in the home 46 and at least one personal computer 50 in the home 46 preferably will communicate with the home gateway server 48 via wireless communications 236 or via hardwire lines (not shown) in the home 46. The system thus preferably includes a local area network (LAN), and specifically a home area network (HAN) designed to network home appliances, audio and visual equipment, and computing devices. The dispensing computers use the network to transmit orders for supply containers 33a through 33d to the order processing system 14.

Detailed Description Text (35):

The order processing system 14 includes a processor or server 14a, server communication software 14b for communicating with the dispensing computer 24, a relational database 14c connected to the server 14a, database software (not shown) for accessing and storing information on database 14c, supplier software 14d for communicating with the suppliers, administrative software 14e for handling the administrative functions of the order processing system, at least one and preferably a plurality of administrative terminals (not shown) and output devices (not shown) connected to the server over a computer network system such as an Ethernet system. Processor or server 14a may be any feasible server type although the preferred server type is Microsoft SQL Server. The relational database 14c is adapted to collect and store data regarding consumer usage and consumption of appliance supplies in geographic areas. The administrative computers and one or more output devices enable administrative computer operators to access the server, make any necessary changes and to generate reports regarding the users, consumption, use and orders. Order processing system 14 receives the orders from the dispensing computer, stores various categories of useful data related to users, supplies and services and sends orders to the appropriate suppliers as discussed below.

Detailed Description Text (36):

Administrative computer operators use administrative computers which are loaded with server administrative software 14e and supplier software 14d. Server administrative software 14e provides a graphical user interface which administrative computer operators use to access, use, format, manipulate and interact with the data available on database 14c. Preferably, administrative computer operators process orders and respond to user needs regarding low appliance supply events and technical problems. Administrative computer operators determine the particular products or services needed by a user, contact a supplier of such products or services and direct the supplier to supply such products or services. Administrative computer operators also generate various graphic and statistical reports, preferably general customer reports, customer invoices, consumption trend graphs, usage forecasts, postage, labels, and demographics, preferably appliance supply usage by zip code, area code, city, and state.

Detailed Description Text (37):

The suppliers may be the system implementor, or manufacturers, distributors or vendors of the appliance supply. As indicated above, the suppliers preferably, but not necessarily, are located or have a place of business near the users. Each supplier preferably has a supplier system 18 which communicates with the order processing system 14 through the supplier communication channel 20. The supplier system 18 includes a processor or server (not shown),

server communication software (not shown) for communicating with the order processing system, at least one administrative terminal (not shown) connected to the server, and conventional output devices (not shown) for printing user supply and repair orders and related documentation. Preferably, the supplier system 18 includes a memory device or database for storing software or data.

Detailed Description Text (38):

The supplier system 18 obtains orders and obtains the relevant user data necessary to deliver the supplies or services to the users. Suppliers can deliver the appliance supply containers directly to the user. Alternatively, suppliers can use an independent contractor such as the United Parcel Service, Federal Express or the postal service to deliver the appliance supply containers to the user. In a further alternative embodiment, the supplier can be a local manufacturer or supplier or can supply local distributors with orders to process for delivery.

Detailed Description Text (40):

During the operation of the distribution system 10 as discussed below, the levels of appliance supply decrease. Dispensing or appliance computer 24 monitors these supply levels, preferably by monitoring the time the dispenser dispenses each appliance supply at a known flow rate. When the levels decrease to a certain amount, dispensing or appliance computer 24 automatically transmits an order to order processing system 14. The dispensing or appliance computer 24 also monitors dispensing apparatus 28 for break downs or technical problems. If the dispensing apparatus 28 needs repair, dispensing computer 24 transmits an order to order processing system 14.

Detailed Description Text (49):

If at any time the gateway server receives a bad packet it will ignore the packet and not respond. The gateway should then timeout and resend the message, preferably continuing this process a maximum of four times. If after the fourth time, a good packet has not been received, the gateway preferably waits for the next scheduled communication session to try again. If a valid packet still has not been received after the second communications session, the gateway server preferably notifies the server of the order processing system.

Detailed Description Text (54):

Referring now to FIGS. 8, 8A and 8B, to use the system 10 of the present invention, a user must purchase an appliance containing the dispensing apparatus 28 as indicated by block 200, or purchase an appliance conversion kit as discussed below. After the appliance is delivered and installed (or the conversion kit is installed), the user opens an account with the system implementor who operates the order processing system as indicated by block 202. The user preferably opens an account with the system implementor using a registration process provided through the user interface panel. The touch screen interface panel preferably displays a keyboard through which the user registers. The registration process includes entering user information, supply selections and user credit card information. During the registration process, the entry of the zip code of the user will preferably, but not necessarily, determine the supplier of the products and supplies for the user. It should be appreciated that alternative registration processes may be employed in the system of the present invention such as registration by telephone, mail or the internet (via a stand-alone or networked internet access device).

Detailed Description Text (55):

It should be appreciated that appliance manufacturers such as General Electric and Whirlpool are currently working on incorporating computer systems into their appliances. Such computer systems include interfaces and processors. The present invention could be incorporated into such systems. For instance, GE is currently planning to use a Windows CE computer interface architecture and Whirlpool is currently planning to use a Sun Microsystems--Java architecture. It should be appreciated that the present invention may be adapted for either system or any other suitable appliance computer system.

Detailed Description Text (56):

The dispensing computer 24 may be initialized or configured during installation or during the first communication with the order processing system 14 during which the order processing system 14 transmits set-up data or files to the dispensing or appliance computer 24 as indicated by block 204. The set-up data or files preferably include appliance supply information, computer programs, graphic files, advertisements and messages as described above.

The registration process described above is part of the initial set-up process.

Detailed Description Text (57):

During the initialization process or the registration process, the user will order a plurality of appliance supplies and will need to agree to a price for the supplies. The user interface will provide pricing information to the user for enabling the user to make the determination as to which supplies the user will order. It should be appreciated that the prices may be different in different regions and that the suppliers or local distributors may need to set the prices. This information is preferably delivered to the user via the order processing system. It should also be appreciated that the prices may change. The system will preferably send any price change message to the dispensing computer and display the price changes to the user in the message screen or interface discussed above. The user will need to agree to the price changes. The user's agreement to the price changes is transmitted to the order processing system. It should also be appreciated that the order processing system may provide a web site and other communication means such as a toll-free number as discussed above to enable the user to determine prices, obtain help or find out more information about the use of the system.

Detailed Description Text (58):

In one alternative embodiment of the present invention, the dispensing or appliance computer 24 generates a warning message if, after the elapse of a pre-determined warning time, the dispensing or appliance computer 24 has not communicated with order processing system 14 as indicated by diamond 206. The warning time may be any period of time, though preferably it is three days. The warning message appears on screen 34 to alert the user of a communication problem, as indicated by block 208. The warning message may be in audio, video or textual form or any combination thereof.

Detailed Description Text (59):

In the alternative embodiment, after generation of a warning message, either the shutdown time elapses without a communication or a communication occurs before shutdown time elapses. Shutdown time may be any period of time greater than the warning time, though preferably seven days. As indicated by diamond 210, if the shutdown time elapses without a communication, the appliance supply distribution and dispensing system 10 shuts down as indicated by block 212. If a communication occurs before the elapse of warning time or shutdown time, a subsequent communication can be initiated.

Detailed Description Text (60):

The user may initiate a communication with the order processing system 14 to place an order for supplies, to change the type of appliance supply the user desires or for any other suitable purpose as described in detail above and as indicated by block 214. The dispensing or appliance computer 24 may also initiate communications with the order processing system 14 based on its monitoring of the dispenser and dispensing apparatus.

Detailed Description Text (61):

The dispensing or appliance computer 24 determines if there is a low appliance supply for any one of the plurality of appliance supplies in the appliance, or a technical, electrical or mechanical problem with the dispensing apparatus or dispensing computer, as respectively indicated by blocks 218, 220 and 222. The dispensing computer communicates these events to the order processing system. Additionally, at regular intervals (preferably every seven days), the dispensing or appliance computer communicates the status of the dispensing apparatus (including usage or supply levels) and the dispensing or appliance computer to the order processing system, as indicated by block 216.

Detailed Description Text (62):

Preferably, a low appliance supply event exists when the appliance supply is within a certain amount of days of depletion based on the user's average consumption or use, preferably in the range of two to three days as discussed below. It should be appreciated that the appliance supply can be any type of supply, including, without limitation, liquids, solids such as powders, gases and replacement parts. It should also be appreciated that the dispensing computer can order appliance supply at any predetermined time, as otherwise set by the implementor or as ordered by the user.

Detailed Description Text (64):

For any embodiment, a technical problem event 222 exists at any time the dispensing apparatus

28 (or appliance) is in need of repair, or there is a communication problem between the dispensing computer and the order processing system 14.

Detailed Description Text (65):

Referring now also to FIG. 9, the communications between the dispensing computer and the order processing system include predetermined basic information generally including the identification of the dispensing apparatus 28, the amount of appliance supply and the purpose for the communication. Preferably, such information will include at a minimum, the basic data 300 identified in FIG. 9, which includes: (i) a dispensing apparatus unit identification 302; (ii) an appliance supply identification 304; (iii) the appliance supply amount 306; (iv) the event identification 308; (v) usage information 310; and (vi) set-up files or other information.

Detailed Description Text (66):

Preferably the average daily usage is calculated for each appliance supply and used to re-order appliance supply to maintain an adequate supply for the user at all times. In the refrigerator embodiment discussed below, preferably the dispensing computer also calculates the total carbonated and non-carbonated drink supply to maintain CO.sub.2 usage and to maintain an adequate CO.sub.2 supply. In the embodiment having one CO.sub.2 container which is used for several beverages, if the beverages are used evenly, the CO.sub.2 supply will be depleted before any one of the individual drink supplies. The dispensing computer accounts for this and all other appliance supply use scenarios. Accordingly, it is preferable to have at least one spare CO.sub.2 supply container maintained by the user.

Detailed Description Text (67):

The dispensing computer will track the canister levels for each appliance supply that is installed in the dispensing apparatus. This is accomplished by tracking the time in seconds each appliance supply is dispensed. Using the constant flow rate of a dispensed appliance supply along with the time the appliance supply has dispensed, a relatively accurate canister level can be calculated when required. The constant flow rate is given by knowing the regulated psi and inner diameter of the dispensing hose or line.

Detailed Description Text (69):

When a communication is caused by a low appliance supply, the dispensing computer 24 transmits an order for the appliance supply to the order processing system 14 as indicated in block 226. This order includes the appliance supply identification 304 and preferably the number of containers of appliance supply needed.

Detailed Description Text (70):

In one embodiment of the invention, the system 10 prevents the user from installing supplies which were not ordered by the dispensing computer 24. In this embodiment, the user must enter into the dispensing computer 24 an appliance supply authorization code which was included in the supply shipment. The appliance supply distribution and dispensing system 10 will not dispense any new appliance supply unless the appliance supply authorization code has been entered. The order processing system 14 generates and stores an appliance supply authorization code for such order and transmits the code to the dispensing computer when the order processing system receives the order. Alternatively, the dispensing computer could create the code or be preloaded with codes. When the appliance supply is prepared for delivery to a user, the appliance supply authorization code is associated with the appliance supply containers. Preferably, the appliance supply authorization code is a twelve digit number encoded on the containers of the appliance supply.

Detailed Description Text (71):

In another embodiment, the dispensing computer tracks the amount of appliance supply that is ordered from the order processing system. If the appliance supply installed into the dispenser is not the appliance supply that was ordered or if the amount of a particular type of appliance supply exceeds the amount that was ordered, the dispensing apparatus may be adapted to shut down or display an error message. One reason for tracking of supplies is to verify that the appliance supply originated from a legitimate source. This will prevent the user from obtaining appliance supply from unauthorized third party sources. If more appliance supply is installed into the dispenser compared to the amount ordered, this would indicate that supplies are being obtained from outside sources.

Detailed Description Text (72):

In one embodiment of the present invention, each appliance supply has a unique four digit appliance supply ID. The first two digits indicate the type of appliance supply classification and the second two digits indicate the appliance supply within the classification. These IDs are assigned by the system implementor. When the user selects an appliance supply from the selection screen, they are indirectly selecting the appliance supply canister with the associated appliance supply ID number. When the CE-SBC informs the gateway server of the class IDs, it also sends the associated appliance supply IDs along. If a user changes from one appliance supply to another appliance supply, dispensing computer will know that one of the appliance supply canisters is to be replaced upon the next order.

Detailed Description Text (75):

As indicated by block 228 in FIG. 8, when dispensing or appliance computer 24 transmits an automatic order to order processing system 14, a process flag is set as false and stored in the database 14c. As indicated by block 232 and discussed in detail below, the process flag is set as true when the supplies or services requested by the triggering event have been provided or rendered to the user.

Detailed Description Text (76):

In all communications, the dispensing or appliance computer 24 transmits the basic data 300 to the order processing system 14 through the dispensing communication channel 16. Dispensing or appliance computer 24 also transmits specific data 312 to the order processing system 14, associated with specific activities, as indicated by block 234. Server or processor 14b inputs the basic data 300 and specific data 312 in the database 14c. In certain communications, as indicated by block 236, the order processing system 14 will transmit certain data, images and electronic files to the dispensing computer 24. Graphic images are preferably transmitted using JPEG type files, and movies are preferably transmitted using MPEG type files as indicated above.

Detailed Description Text (77):

As further illustrated in FIG. 9, database 14c preferably stores several types of data 312 including user data 314, supplier data 316, dispensing apparatus data 318, dispensing computer setting data 320, appliance supply data 322, event data 324 and service data 326.

Detailed Description Text (78):

User data 314 preferably includes a user identification code, a supplier identification code, the company name if the user is a business, a dispensing apparatus unit identification code, the last name of the user, the first name of the user, the street address of the user, and the city, state, zip code and phone number of the user. User data 314 may also include other information such as demographics on individual household members, visitors and others in addition to data about the user who opened an account to use the appliance supply distribution and dispensing system 10.

Detailed Description Text (79):

Supplier data 316 preferably includes a supplier identification code and the company name of the supplier. Dispensing apparatus data 318 preferably includes a dispensing apparatus unit identification code, a plurality of appliance supply identifications and associated appliance supply levels for each appliance supply dispensed by the dispensing apparatus and the dispensing computer setting identification code. The number of appliance supply levels will depend on the number of appliance supply containers used by the dispensing apparatus and the number of different uses made of the appliance. This information will be contained in the dispensing computer and transferred to the order processing system during initialization. Dispensing computer setting data 320 preferably includes a dispensing computer setting identification code and a dispensing computer setting. Appliance supply or concentrate data preferably includes an appliance supply identification code, the appliance supply name and the logo of the appliance supply.

Detailed Description Text (80):

Event data 324 preferably includes: (i) an identification code of events for a low appliance supply and a technical problem; (ii) a date and time stamp for recording the event occurrence; (iii) the type of event; (iv) the number of appliance supply containers needed; (v) the appliance supply authorization code; (vi) a service identification code; and (vii) a process flag (true or false).

Detailed Description Text (81):

Service data 326 preferably includes a service identification code and a description of the service. It should be appreciated that the basic data and additional data recited above is preferred and that other data could be included in the appliance supply distribution and dispensing system 10 of the present invention.

Detailed Description Text (83):

When the order processing system 14 receives an appliance supply order, the order processing system 14 preferably communicates the order to supplier system 18 designated to serve the particular user. Alternatively, when such an order is received by the order processing system 14, an administrator may communicate the order to a supplier system 18 designated to serve a particular user as indicated by block 238.

Detailed Description Text (85):

The supplier system 18 facilitates the delivery of the ordered supply, to the user, as discussed below. The system places the order or makes the supply needs known to the appropriate supplier, as indicated by block 251. One of the supply systems delivers the supplies to the user as also indicated by block 251 and the user then installs the appliance supply in the appliance. If the monitoring system or dispensing or appliance computer 24 determines that the appliance supply delivered and installed corresponds to the appliance supply ordered as indicated by block 252 and diamond 254, the appliance supply distribution and dispensing system 10 continues to operate, as indicated by block 256.

Detailed Description Text (86):

If the installed appliance supply does not correspond to the order, the dispensing apparatus 24 may be adapted to shut down as indicated by block 212. When a shut down occurs, electrical power is blocked so that the dispensing apparatus 28 will not dispense any appliance supply.

Detailed Description Text (87):

Supplier system will use a reliable deliverer (not shown) to deliver the appliance supply containers to the user. Deliverer may be an employee of supplier or a reliable outside package delivery company such as the United Parcel Service, Federal Express, the postal service or other similar delivery organizations. Deliveries will be made to the place of delivery within a certain delivery time, preferably within three days after an order or communication is transmitted to the order processing system. Preferably each delivery of appliance supply includes at least two containers of appliance supply.

Detailed Description Text (88):

Dispensing or appliance computer 24 monitors the amount of each type of appliance supply dispensed and calculates the amount of each appliance supply used. Each time an order or low appliance supply message is transmitted to the order processing system 14, dispensing computer 24 tracks the amount of appliance supply ordered.

Detailed Description Text (89):

It should also be appreciated that a conversion kit may be used to convert a standard appliance into an appliance having the dispensing apparatus of the present invention. Such a conversion kit may include a stand-alone unit which has a separate power source and various fluid lines connecting to the appliance.

Detailed Description Text (90):

It should also be appreciated that the system could be adapted to dispense concentrated, non-concentrated, ready-to-drink or pre-mixed appliance supplies such as milk, beer, wine and juices for refrigerator embodiments, liquid or powder detergents for washing machine embodiments and other supplies for other appliances. As mentioned above, it should be appreciated that any embodiment of the appliance supply distribution and dispensing system could be adapted for a powder or solid drink supply.

Detailed Description Text (91):

Furthermore, although the system of the present invention is described herein at times as including a supply dispensing computer and a supply dispenser, it should be appreciated that the present invention can include any type of supply monitoring or appliance computer. Moreover, the system need not include a supply dispenser or any type of dispenser because the

system can support appliance supplies which cannot be dispensed. Examples of such appliance supplies are replacement parts, such as filters, batteries or light bulbs. Other examples are water softeners and other products which are immersed in water and which slowly dissolve with time. The system of the present invention can be adapted to monitor the use and depletion of these types of supplies and any other type of appliance supply.

Detailed Description Text (93):

As illustrated in FIG. 10, in one embodiment of the present invention, the appliance 12f which houses the appliance supply dispensing apparatus 28 is a conventional refrigerator which includes a refrigeration compartment (not shown), a refrigeration compartment door 400, a freezer compartment (not shown) and a freezer compartment door 402. Refrigerator 12f may be constructed in various shapes, sizes, designs and models including side-by-side door models as illustrated in FIG. 10 and upper and lower door models (not shown). Refrigerator 12f preferably includes standard mechanisms and cooling systems present in commercially available appliances. However, refrigerator 14a is specifically constructed, structurally and electrically, to house and accommodate a supply dispensing apparatus 28 for refrigerators and its functions and use as described herein.

Detailed Description Text (116):

Although not shown, the dispensing apparatus housed in any appliance could include a bar code reader or other label recognition system which reads a bar code or other label on supply containers. The bar codes or other labels would include pertinent information regarding the supply. When the user replaces the supply, the bar code reader would read the bar code or label and would know that a new or replacement supply is being placed in the housing. The dispensing or appliance computer can then update the supply tracking data. The supply containers will preferably come with detailed instructions which describe how the user should replace the container and which containers to replace.

Current US Cross Reference Classification (5):

705/28

Other Reference Publication (7):

"Whirlpool Internet-Enabled Appliances to Use Beeline Shopper Software Features," Feb. 16, 2001.

Other Reference Publication (13):

Tour A Virtual Trade Show from appliancemagazine.com printed on May 2, 2000.

CLAIMS:

1. A refrigerator having a processor operable to communicate with an order processing system, said refrigerator comprising: a housing; a support member connected to the housing, the support member operable to support a plurality of containers, each of the containers containing a drink supply of a different flavor; an apparatus connected to the housing, the apparatus operable to produce a plurality of different flavors of beverages, each of the beverages derived, at least in part, from one of the drink supplies; a sensing device communicating information to said processor and determining an amount of drink supply dispensed by said apparatus; an input device operable with the processor to enable a user to input an order for a supply of an amount of one or more of the drink supplies; at least one memory device accessible by the processor, the memory device storing a plurality of conditions associated with the containers, one of the conditions relating to an amount of the drink supply remaining in one of the containers and another one of the conditions relating to an amount of the drink supply remaining in another one of the containers, based upon the information communicated by said sensing device to said processor, the memory device storing a plurality of instructions executable by the processor to: (a) receive an input signal from the input device, the input signal associated with the user's order for an amount of one or more of the drink supplies; (b) send data to the order processing system, said data associated with the user's order, thereby causing said amount of said one or more drink supplies to be delivered to an address associated with the refrigerator; (c) acquire data related to an amount of the drink supply remaining in each of the containers; (d) determine, for each of the containers, when the condition associated with said container is met; (e) send data to the order processing system after one of the conditions is met, said data associated with an order for an amount of the drink supply for one of the containers, thereby causing said amount of said drink supply to be delivered to an address associated with the

réfrigerator; and (f) send data to the order processing system after another one of the conditions is met, said data associated with an order for an amount of the drink supply for another one of the containers, thereby causing said amount of said drink supply to be delivered to an address associated with the refrigerator wherein said instructions permit the steps of send data for said one and said another containers to occur independent of one another.

9. A refrigerator having a processor operable to communicate with an order processing system, said refrigerator comprising: a housing; a support member connected to the housing, the support member operable to support a plurality of containers, each of the containers containing a drink supply of a different flavor; an apparatus connected to the housing, the apparatus operable to produce a plurality of servings of different flavors of beverages over a plurality of time periods, each of the beverages derived, at least in part, from one of the drink supplies, wherein the production of each of the servings depletes a portion of one of the drink supplies, said portion flowing from one of the containers at a flow rate; a sensing device communicating information to said processor and determining an amount of drink supply dispensed by said apparatus; an input device operable with the processor to enable a user to input an order for a supply of an amount of one or more of the drink supplies; at least one memory device accessible by the processor, the memory device storing a plurality of conditions associated with the containers, one of the conditions relating to an amount of the drink supply remaining in one of the containers and another one of the conditions relating to an amount of the drink supply remaining in another one of the containers based upon the information communicated by said sensing device to said processor, the memory device storing a plurality of instructions executable by the processor to: (a) receive an input signal from the input device, the input signal associated with the user's order for an amount of one or more of the drink supplies; (b) send data to the order processing system, said data associated with the user's order, thereby causing said amount of said one or more drink supplies to be delivered to an address associated with the refrigerator; (c) determine how much of the drink supply is remaining in each of the containers based on the time periods and the flow rates; (d) determine, for each of the containers, when the condition associated with said container is met; (e) send data to the order processing system after one of the conditions is met, said data associated with an order for an amount of the drink supply for one of the containers, thereby causing said amount of said drink supply to be delivered to an address associated with the refrigerator; and (f) send data to the order processing system after another one of the conditions is met, said data associated with an order for an amount of the drink supply for another one of the containers, thereby causing said amount of said drink supply to be delivered to an address associated with the refrigerator wherein said instructions permit the steps of send data for said one and said another containers to occur independent of one another.

14. A refrigerator having a processor operable to communicate with an order processing system, said refrigerator comprising: a housing; a support member connected to the housing, the support member operable to support a plurality of containers, each of the containers containing a drink supply of a different flavor; an apparatus connected to the housing, the apparatus operable to produce a plurality of servings of different flavors of beverages over a plurality of time periods, each of the beverages derived, at least in part, from one of the drink supplies, wherein the production of each of the servings depletes a portion of one of the drink supplies, said portion flowing from one of the containers at a given flow rate; means for measuring said time periods; an input device operable with the processor to enable a user to input an order for a supply of an amount of one or more of the drink supplies; and at least one memory device accessible by the processor, the memory device storing a plurality of instructions executable by the processor to: (a) receive an input signal from the input device, the input signal associated with the user's order for an amount of one or more of the drink supplies; (b) send data to the order processing system, said data associated with the user's order, thereby causing said amount of said one or more drink supplies to be delivered to an address associated with the refrigerator; (c) determine how much of the drink supply is remaining in each of the containers based on the time periods and the given flow rates; (d) determine, for each of the containers, when the drink supply in said container is depleted to a certain amount; (e) send data to the order processing system after the drink supply in one of the containers is depleted to a certain amount, said data associated with an order for an amount of said drink supply, thereby causing said amount of said drink supply to be delivered to an address associated with the refrigerator; and (f) send data to the order processing system after the drink supply in another one of the containers is depleted to a certain amount, said data associated with an order for an amount of said drink supply, thereby causing said amount of said drink supply to be delivered to an address associated with the refrigerator wherein said instructions permit

the steps of send data for said one and said another containers to occur independent of one another.

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Jul 24, 2003

DOCUMENT-IDENTIFIER: US 20030139982 A1

TITLE: ORC online inventory management system

Summary of Invention Paragraph:

[0009] The present invention addresses the aforementioned needs within the prior art by providing an inventory management system employing a single database to manage the inventory of multiple Operator Replaceable Components for serviceable equipment. The inventory management as envisioned by the present invention details and records remaining life information related to Operator Replaceable Components by recording the use, and the types of use, for which these Operator Replaceable Components are employed. Critical thresholds for the remaining life of the Operator Replaceable Components can be customized and used for the inventory management for multiple machines. The inventory database can be used for the automated creation of an Operator Replaceable Component (ORC) reorder sheet and operator notification when it is time to replace components that have used their expected life.

Detail Description Paragraph:

[0051] A further embodiment of the present invention patent is to use a weighted average incorporating a predefined "default life" for initial part replacement until a suitable number of replacements histories have been made to provide an "interim" accurate average. As an example, take 10 histories as a sample of the preferred number of histories to use to determine future life, if there is less than 10 histories, a weighted average based on the number of histories available (up to 10) divided by 10 (which gives us a number between 0.0 and 1.0, where we get 1.0 if we have at least 10 histories and we get 0.0 if we have no replacement histories) multiplied by the average of the histories and the inverse of this number multiplied by the "default life" and the two numbers then added together to give us a predicted life. The Calculation of weighted Average of less than 10 ORCs and a "Default Life" is shown by Equations 3a, 3b and 3c.

Detail Description Paragraph:

[0056] Still referring again to FIG. 5, the present invention envisions two basic models of tracking inventory for ORC devices. The first model uses the capabilities of the user interface (GUI 106) for each of the NexPress.RTM.2100 printing devices 505 to provide for the inventory tracking. In this first model, the ORC devices are placed into NexPress.RTM.2100 printing devices 505 by the printer operator, the printer operator then identifies the replacement of that ORC device to the inventory management system 500 by making an entry using the GUI 106 to that printing device 505. The interface between the print devices 505 and the master 510 of the inventory management system 500 receives the entry that was made locally at the printing device 505 and enters the consumption data to the inventory database. The master 510 takes local entries from the printing device 505 and places it into the inventory, which is globally maintained for all pieces of equipment in the inventory management system 500. The globally maintained inventory then removes the replaced ORC device from the inventory. Locally, the NexPress.RTM.2100 printing device 505 will allow the printer operator to view information relating to the remaining life, replacement history and average expected life of the ORC devices after an ORC device has been replaced as previously discussed. Additionally, the interface between the master 510 and the NexPress.RTM.2100 printing device 505 will allow the printer operator to view information relating to the entire inventory. Globally, the inventory management system 500 tracks inventory consumption directly through the communication interface between the master 510 to inventory management system 500 and all NexPress.RTM.2100 printing devices 505 sharing the inventory.

Detail Description Paragraph:

[0057] In the second model, the inventory master 510 controls the updating of the inventory directly from the master 510. The second model would be preferable where, for example, a vault

is used to store the inventory for the ORC devices. Each time an ORC device within a NexPress.RTM.2100 printing device 505 is to be replaced, the replacement part would have to be retrieved from the inventory, which is stored in the vault. The inventory master 510 would typically have a location that is associated with the vault, or even located at the vault. In the second model, the operator of the inventory master 510 would be responsible for the management of the inventory and the printer operator for the printing device 505 would only respond to messages that are generated locally from the NexPress.RTM.2100 printing device 505 to replace any given ORC device. Therefore, the operator of the inventory master 510 would be responsible for entering data relative to the inventory and there is no need for inventory usage to be entered separately by the operator of the NexPress.RTM.2100 that is actually receiving the ORC device that is being removed from inventory.

Detail Description Paragraph:

[0062] The inventory management system 500 within the preferred embodiment is accessible by the operator for any NexPress.RTM.2100 printing device 505 that shares the inventory simply by using the GUI 106 to the printing device 505. Communication between the application and an external server(s) provide the transactional data needed to process orders. Critical thresholds relative to the remaining life of the ORC devices can be customized for the inventory management of multiple machines. These thresholds can be used by the inventory database to trigger the automatic creation of an ORC device order sheet accompanied by an operator notification that it is time to replace an ORC device that has already been in use for its' expected life. The system of the preferred embodiment provides a GUI 106 that allows the printer operator, or some other person in the print shop such as the operator of the inventory master 510, to set reorder levels, generate recommendation reports, pull inventory, receive inventory, examine inventory, order inventory, reorder inventory, log activities, configure inventory, and modify inventory for ORC devices. The inventory management system 500 of the invention thus enables a print shop to manage inventory by placing orders, creating ordering forms, writing reports related to machine usage and generally, maintain the inventory. Table 2 below illustrates a typical ORC inventory listing, as it would be displayed on a GUI 106 for a NexPress.RTM.2100 printing device 505.

Detail Description Paragraph:

[0077] FIG. 6 is an illustration of the screen that is presented on the GUI 106 for replacement part details of a specific ORC within inventory. The ORC Inventory Part Details 600 screen shown in FIG. 6 is displayed once the operator for the NexPress.RTM.2100 printing device 505, or the inventory master 510, selects this function from the GUI 106. The ORC Inventory Part Details 600 screen shows similar information to that shown in Table 2 for the same catalog (ORC) number. There are three buttons, Adjust ORC Qty 725, Receive ORC 750, and Set ORC Levels 775, at the top of the ORC Inventory Part Details 600 screen that can be clicked on by the operator to allow one of several actions to be taken in relation to the management of inventory for this part.

Detail Description Paragraph:

[0079] Referring to FIG. 7b, which is an illustration of the Receive ORC Inventory 740 screen that is presented for adjusting details for a specific ORC within inventory once that ORC has been received and has to be entered into inventory, Receive ORC Inventory 740 is displayed after the operator clicks on the Receive ORC 750 button shown on the ORC Inventory Part Details 600 screen in FIG. 6. Receive ORC Inventory 740 allows the operator to enter received stock items into the inventory database by placing the number of that newly received ORC device into the Qty received field 741. Once a number is placed into the Qty received field 741 and the operator clicks on the Submit Changes 742 button, the quantity in the Qty received field 741 is added to the existing amount currently in inventory for that ORC device. If for any reason the operator decides that the current Receive ORC Inventory 740 screen is not correct, the operator can press cancel 742 to abort the current operation.

Detail Description Paragraph:

[0081] FIG. 8 is an illustration of the Calculate ORC Reorder Levels 800 screen that is presented upon selection from the GUI 106. The Calculate ORC Reorder Levels 800 screen is used by the inventory management system 500 for setting parameters use to calculate levels at which ORC devices are reordered. Average Monthly Print Volume 810 is a field where the operator can adjust the number of prints that the system is estimated to make on a monthly basis. The monthly print volume is important in estimating the overall ORC device usage that will occur on a monthly basis and the Average Monthly Print Volume 810 can be adjusted with varying usage

patterns of the printing system. Work Days Per Month 820 is a field that represents the total number of days that the printing system is going to be operating. Orders Per Month 830 is a field that contains the number of times in a month that the inventory will be ordered and restocked. The field Days to Fulfill Order 840 contains the estimated time to receive stock after it has been ordered. Safety Factor 860 is a field that represents a summation of the previously discussed fields in the Calculate ORC Reorder Levels 800 screen. Safety Factor 860 is a measure of assurance that replacement parts will be received within a time frame that will ensure that the printing system will not suffer any down time. The higher the Safety Factor 860 the greater the assurance is that there is sufficient stock within the inventory on hand to ensure that replacement parts will be received without the printing devices 505 suffering any downtime. The operator can insert a desired Safety Factor 850 and the inventory management system 500 will take the desired Safety Factor 850 into account when order forms for replacement parts are generated. The higher the Safety factor that is entered, the greater the number of replacement parts that will be placed on the order sheet. Recalculate 860 is a graphical button that an operator can click on to initiate the recalculation of the automatic order sheet. The automatic order sheet envisioned by the invention is similar to the ORC Recommendation Report shown in Table 3. By clicking on Recalculate 860, the operator takes all the values that have been entered into the fields within the Calculate ORC Reorder Levels 800 screen, and generates an order sheet in accordance with those values.

CLAIMS:

1. An inventory management system comprising: at least one piece of equipment; a plurality of components within said piece of equipment, each of said components having an expected lifetime; a computational element operatively coupled to said equipment; an inventory of replacement parts for said components contained within said computational element; and a mechanism for tracking said inventory by recording a total of said expected lifetime of said components within said inventory.
3. The inventory management system of claim 1, wherein said user interface further comprises an input to said user interface, said input cataloging replacement parts placed into and removed from said inventory.
5. The inventory management system of claim 1, wherein said mechanism further comprises: at least one threshold for each of said components that is compared against a predetermined parameter for each of said serviceable components; and an inventory database that tracks replacement parts for each of said components within said inventory.
7. The inventory management system of claim 1, wherein said tracking mechanism further comprises an inventory notification system coupled to said inventory database.
17. The inventory management system of claim 11, wherein said inventory management system automatically creates an order form for a specific number of replacement parts based on remaining inventory of said replaceable components.
32. The method of inventory management of claim 22, wherein the step of managing further comprises generating an order form for a specific number of replacement parts based on remaining inventory of said replaceable components.

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Apr 18, 2002

DOCUMENT-IDENTIFIER: US 20020045986 A1

TITLE: Display device for work machine

Detail Description Paragraph:

[0066] The database 140A, which is a database wherein are stored data related to the construction company 30A, comprises a 3D Gantt chart schedule and performance results database 141A, a service history database 142A, and an internal company 30A parts inventory database 143A.

Detail Description Paragraph:

[0067] The 3D Gantt chart schedule and performance results database 141A stores 3D Gantt chart schedule and performance results data for construction work performed by the construction company 30A. The service history database 142A stores the history of service provided to construction machines at the construction site of the construction company 30A. And the internal company 30A parts inventory database 143A stores data on construction machine parts in inventory at the construction company 30A.

Detail Description Paragraph:

[0143] Thus, at the parts depot 20 and service point 22, respectively, parts demand forecast information 176 and service demand forecast information 177 can be acquired every time information on construction project scheduled to be ordered is presented from a client, and, based thereon, can secure replacement parts and service personnel for the construction machines that will be necessary for future construction work.

Detail Description Paragraph:

[0220] In the maintenance failure fatality level data, as diagrammed in FIG. 17(b), standard values for the specified sensor detection values a, b, e, and g are established for each lever control input signal f4, f5, and f6, that is, for each work condition f4, f5, and f6. When the work condition is f4, for example, the judgment "oil filter replacement necessary" is made when any of the specified detection values a, b, e, or g is equal to or greater (or equal to or less than, depending on the sensor type) than the standard value a4, b4, e4, or g4 respectively, but is otherwise judged to be normal (step 402); otherwise the judgment "oil filter replacement unnecessary" is made. Similar judgments are made for the other maintenance locations, and locations where maintenance should be performed are specified. When, as a result, the judgment "oil filter replacement necessary" is made, three-dimensional shape (3D) data for the maintenance location (vicinity of where the engine oil filter is attached) and for the replacement part (oil filter) are read out from the 3D parts shape database 161 (step 404).

Detail Description Paragraph:

[0221] Next, when it is necessary to replace a part in performing the maintenance, data on whether or not that part is in inventory in a warehouse of the construction company 30A that is in possession of the follower machine 35 are retrieved from data stored in the internal company 30A parts inventory database 143A, and that part is requisitioned (step 405).

Detail Description Paragraph:

[0224] In steps 405, 406, and 407, a part value corresponding to the type "B" and model "model 1" replacement part "oil filter" is read out from the service parts price database 132. Also, the service fees corresponding to the type "B" and model "model 1" replacement part "oil filter" are read out from the service fee database 131. By service fees, here, are meant fees that include both the fees for dispatching service personnel established according to the distance from the service point 22 to the construction site, and the labor cost required for the repair (part replacement). Also, the maintenance time required (repair time) corresponding to the type "B" and model "model 1" replacement part "oil filter" is read out from the

maintenance time required data database 158. By maintenance time required (repair time) here is meant the time required for the repair (part replacement) at the construction site.

Detail Description Paragraph:

[0244] The server apparatus 11 stores service history data indicating maintenance content (parts replacement, repair particulars) and invoice amounts (parts prices, service costs) in the 30A company service history database 142A, and updates the content stored in the 30A company service history database 142A. In this manner, service history data are stored, categorized by construction company, i.e. whether for construction company 30A, 50B, 60C, or 70D, by type and model of construction machine, and by particulars of construction work (step 410). The processing performed in steps 401 to 410 was described representatively for the follower machine 35, but that processing is performed in the same manner for the other construction machines 31 and 32 to 34.

Detail Description Paragraph:

[0279] Next, when it is necessary to replace a part (such as the hydraulic pump assembly, for example) in correcting the trouble, data on whether or not that part is in inventory in a warehouse of the construction company 30A that is in possession of the follower machine 33 are retrieved from data stored in the internal company 30A parts inventory database 143A, and that part is requisitioned (step 505).

Detail Description Paragraph:

[0282] In steps 505, 506, and 507, a part value corresponding to the type "P" and model "model 2" replacement part "hydraulic pump assembly" is read out from the service parts price database 132. Also, the service fees corresponding to the type "P" and model "model 2" replacement part "hydraulic pump assembly" are read out from the service fee database 131. By service fees, here, are meant fees that include both the fees for dispatching service personnel established according to the distance from the service point 22 to the construction site, and the labor cost required for the repair (part replacement). Also, the maintenance time required (repair time) corresponding to the type "P" and model "model 2" replacement part "hydraulic pump assembly" is read out from the correction time data database 153. By correction time required (repair time) here is meant the time required for the correction (repair) at the construction site.

Detail Description Paragraph:

[0302] The server apparatus 11 stores service history data indicating maintenance and correction content (parts replacement, repair particulars) and invoice amounts (parts prices, service costs) in the 30A company service history database 142A, and updates the content stored in the 30A company service history database 142A. In this manner, service history data are stored, categorized by construction company, i.e. whether for construction company 30A, 50B, 60C, or 70D, by type and model of construction machine, and by particulars of construction work (step 410). The processing performed in steps 501 to 510 was described representatively for the follower machine 33, but that processing is performed in the same manner for the other construction machines 31, 32, 34, and 35.

Detail Description Paragraph:

[0376] More specifically, as described earlier, in the 3D Gantt chart schedule and performance results database 141A of the service provider company 10 are noted "performance results" for each vehicle ID data 200a for the construction machines 31 to 35. And in the service history database 142A of the service provider company 10 are stored, for each vehicle ID data 200a for the construction machines 31 to 35, service history data, that is, data indicating maintenance and correction particulars (parts replacement, repair particulars), and invoiced amounts (parts prices, service costs).

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